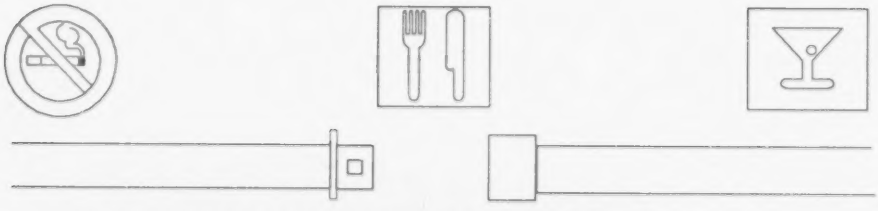
WEST VIRGINIA

BEHAVIORAL RISK FACTOR SURVEY 1988



DIVISION OF PUBLIC HEALTH

OFFICE OF EPIDEMIOLOGY AND HEALTH PROMOTION

1988 WEST VIRGINIA
BEHAVIORAL RISK FACTOR SURVEY

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Supported in part by
The Centers for Disease Control,
Cooperative Agreements
No. U50/CCU300585-05
and
No. U50/CCU300585-06

EXECUTIVE SUMMARY

In 1984, the West Virginia Division of Public Health became one of the initial participants in the Centers for Disease Control's Behavioral Risk Factor Surveillance System (BRFSS). Using a random digit dialing technique, adults were interviewed by telephone about their lifestyle. The 1984-85 findings were published in 1987 and the 1986-87 results in 1988. This report covers 1988 and focuses on health behaviors that can place individuals at increased risk of preventable illness and death: seatbelt nonuse, hypertension, obesity, sedentary lifestyle, cigarette smoking, smokeless tobacco use, and alcohol misuse. The findings are summarized below.

SEATBELT NONUSE Prevalence in 1988 was 56%, a slight decline from the 59% rate observed in 1987. West Virginia ranked third among all participating states in 1988. Men had a higher rate of nonuse than women (61% vs. 51%), and prevalence decreased for both sexes with higher educational and income levels. West Virginia reported the lowest rate of decline of seatbelt nonuse among the 15 BRFSS participants from 1984-88.

HYPERTENSION Prevalence was 19%, declining from 25% in 1987. West Virginia had the eighth highest rate among

all 37 participating states. Hypertension prevalence increased with age and was highest among respondents with less than 12 years of education. Overall prevalence declined with higher income levels. Of the 15 1984-88 BRFSS participants, nine reported upward trends in hypertension, while six experienced downward trends.

OBESITY Prevalence was 29%, similar to the 28% rate in 1987. This placed the state third among all participating states in 1988. Men reported higher prevalences than women overall. No association was established between education and obesity. Men tended to report obesity in the higher income levels, while the opposite trend was found among women. Fourteen of the 15 original BRFSS states reported increased prevalences of obesity from 1984-88.

SEDENTARY LIFESTYLE Adults who reported engaging in little or no physical activity made up 66% of the survey population, placing West Virginia fifth among the 1988 BRFSS states. This compares to a 64% rate observed in 1987. Women reported higher prevalences overall than did men; prevalence decreased with education and income

levels. Sedentary lifestyle prevalence increased in 14 of the 15 participants in the BRFSS from 1984-88.

CURRENT SMOKING The smoking rate in 1988 was 27%, slightly lower than the 1987 rate of 29%. West Virginia ranked sixth among all states in the 1988 BRFSS. Respective rates for men and women were 28% and 26%. Smoking prevalence decreased with higher education and family income. Fourteen of the original 15 BRFSS states experienced declining rates of smoking from 1984-88.

SMOKELESS TOBACCO USE This problem was first studied in 1986. Twenty percent (20%) of adult men were current users in 1988, placing West Virginia first among the BRFSS states. Rates were highest among men reporting the lowest income and educational levels. No trend information was ascertained for smokeless tobacco use.

ALCOHOL MISUSE Prevalences of heavier drinking (averaging two or more drinks a day), binge drinking (five or more drinks on a single occasion), and drinking and driving were 4%, 9%, and 2%, respectively. These rates were again much lower than those observed in other states. Men aged 18-24 had the highest prevalence of all three forms of misuse. Prevalences of all three

forms of alcohol misuse declined from 1984-88 in 14 of the 15 original BRFSS participating states.

Each of these areas is discussed in greater detail in this report. The Division of Public Health's participation in the BRFSS continues; an analysis of the 1989 survey data will be released in 1990.

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INTRODUCTION

In 1984, the West Virginia Division of Public Health (WVDPH), began the operation of a monthly telephone survey, part of the Behavioral Risk Factor Surveillance System (BRFSS) established by the Centers for Disease Control (CDC). The BRFSS was developed by CDC in order to permit states to determine the prevalence of selected health risk factors among their adult populations. Personal health practices or behaviors (risk factors) have been shown to be important determinants of health outcomes, associated with as much as 50% of all mortality. It is clear that the adoption of more healthful lifestyles could ultimately reduce mortality and extend life expectancy in this country. An ever-growing number of states have chosen to participate in the BRFSS since its inception. Fifteen states (including the District of Columbia) took part in 1984, 22 states in 1985, 26 states in 1986, 32 states in 1987, and 37 states in 1988.

Two reports, 1984-1985 Behavioral Risk Factor Surveys and 1986-1987 Behavioral Risk Factor Surveys, have been published by the WVDPH detailing the results of the first four years of West Virginia's participation in the BRFSS. This analysis focuses on 1988 survey results. In addition, an overview is provided of risk factor prevalence trends from 1984 through 1988 for West Virginia and the other 14 states that have participated in the surveillance over the entire five-year period. The risk factors addressed in this report are seatbelt nonuse, current hypertension, obesity,

sedentary lifestyle, current smoking, smokeless tobacco use, heavier drinking, binge drinking, and drinking and driving.

METHODOLOGY

The survey is conducted by telephone and represents a collaborative effort between the West Virginia Division of Public Health and CDC. The Division provides telephones, office space, interviewers, and supervision of the data collection; CDC provides financial assistance, a standardized set of core questions, computer-assisted telephone interviewing software, computers, data processing services, and analytic consultation. Telephone surveillance was chosen as it is less costly than door-to-door household surveys. According to the telephone companies that serve the state, approximately 92% of West Virginia households have telephones.

A prepared introductory statement and the core questions were developed and field-tested by CDC personnel. The questions require approximately ten minutes to complete. In addition to the aforementioned risk factors, they cover standard demographic characteristics. Additional questions of topical interest may be added by individual states.

Sample Selection

The sample is selected by random digit dialing (RDD) rather than through telephone directories since the latter do not include unlisted or new numbers. Sampling is conducted in a multistage cluster design based on the Waksberg Sampling Method for RDD.[1] Consequently, large banks of unassigned and business phone numbers are eliminated from the selection process.

Based on a list of all state area prefixes provided to CDC, seven-digit numbers are randomly computer-generated and then randomly selected. Clusters of numbers are then returned to the state. If the number dialed is a business phone or nonworking number, or if it is busy or not answered on four different days, it is discarded. Three calls are completed from each cluster of numbers. During 1988, 1,735 interviews were completed; seven interviews were not usable for various reasons, leaving 1,728 interviews for analysis.

Interviews and Respondent Selection

Phone calls and interviews were conducted by Health Department employees during a seven- to nine-day period each month. The monthly interview schedule reduced the possibility of bias due to seasonal variations in certain lifestyles. To assure

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[1] Waksberg, Joseph. "Sampling Methods for Random Digit Dialing." J. American Statistical Association, 73 (March 1978): 40-47.

maximum response rates, calls were made primarily during evenings from 4:00 PM to 9:00 PM and on Saturdays from 10:00 AM to 3:00 PM. Eligible respondents for the survey were defined as persons 18 years of age or older who maintained residence at the household contacted. Within each household, the actual respondent was chosen randomly to avoid possible biases related to the time of day and household telephone answering preferences. If the selected individual was not available, an appointment was made to conduct the interview at a later time or date. The distribution of telephone calls during the 1988 survey period by outcome is presented in the table below.

Disposition of All Telephone Numbers in Sample
1988 West Virginia Behavioral Risk Factor Survey

Disposition	Number	Percent
1. Completed Interviews	1,735	41.4
2. Refusals	281	6.7
3. Nonworking Numbers	1,299	31.0
4. No Answer (multiple tries)	302	7.2
5. Business Phones	266	6.3
6. No Eligible Respondent in Household	10	0.2
7. Selected Respondent Unavailable During Survey Period	215	5.1
8. Language Barrier	2	0.0
9. Busy Signal (multiple tries)	20	0.4
10. Mental/Physical Impairment (selected respondent unable to respond)	63	1.5
Total Numbers	4,193	100.0

The refusal rate for 1988 was 13.9%.* The completion rate was 71.7%.**

Editing of the questionnaires was performed monthly to assure proper completion. As a check, call backs were done on a spot basis to confirm that the interview had been conducted as indicated. After the interviews were completed, the diskettes were sent to CDC for analysis, further editing, and weighting.

Accuracy of Estimates

The 1988 surveys were designed to be accurate at approximately $\pm$ 2.4% at the 95% confidence level. This means that we are 95% confident that the overall prevalence estimates produced by the survey are within plus or minus 2.4% of the expected responses if the entire West Virginia population had been interviewed.

Characteristics of the Sample Population

Population characteristics including age, sex, race, educational attainment, and household income level were ascertained. These data are presented on the following page.

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*Refusal rate = $\frac{\text{Refusals}}{\text{Completed Interviews \& Refusals}}$

**Completion rate = $\frac{\text{Completed Interviews}}{\text{Known Eligibles} + [(\text{Known Eligibles}/[\text{Known Eligibles \& Ineligibles}]) \times (\text{Unknown})]}$

DEMOGRAPHIC SUMMARY
1988 West Virginia Behavioral Risk Factor Surveys

	#	% SAMPLE	% 1980 CENSUS
Total	1,728	100.0	100.0
Sex			
Male	643	37.2	47.4
Female	1,085	62.8	52.6
Age			
18-24	166	9.6	17.5
25-34	302	17.5	22.0
35-44	346	20.0	14.9
45-54	241	13.9	14.3
55-64	275	15.9	14.2
65+	398	23.0	17.1
Education			
<12 Years	499	28.9	41.1
12 Years	654	37.8	37.7
13-15 Years	301	17.4	11.7
16+ Years	263	15.2	9.5
Unknown	11	0.6	-
Income			
<$10,000	455	26.3	35.2
$10,000-$24,999	608	35.2	16.1
$25,000+	485	28.1	21.9
Unknown	180	10.4	-

Weighting

Compared to the 1980 census, male respondents and persons 18-34 years of age were underrepresented in the sample, while the elderly (≥65 years of age) were substantially overrepresented, a frequent result of telephone surveys. Survey responses were therefore weighted by the census age and sex distribution in order

to more accurately estimate the actual prevalence of behavioral risk factors in the adult population of West Virginia.

Least-Squares Analysis

The method of least squares was employed to ascertain the average rate of change from 1984 to 1988 for each risk factor for the 15 original BRFSS participants. A least-squares analysis determines the line that best describes the trend of the data under consideration.[2] Because the least-square line is a descriptive analysis, used to estimate individual rates of change, it cannot be used to make statistical conclusions concerning the differences in changes among the participating states.

This report reflects estimated prevalence rates and trends for the nine lifestyles or risk factors covered in the set of core questions in the Behavioral Risk Factor Surveys (BRFS) provided by CDC for the 1988 surveillance activities: (1) seatbelt nonuse; (2) current hypertension; (3) obesity; (4) sedentary lifestyle; (5) current smoking; (6) smokeless tobacco use; and alcohol misuse, comprised of (7) heavier drinking; (8) binge drinking, and (9) drinking and driving.

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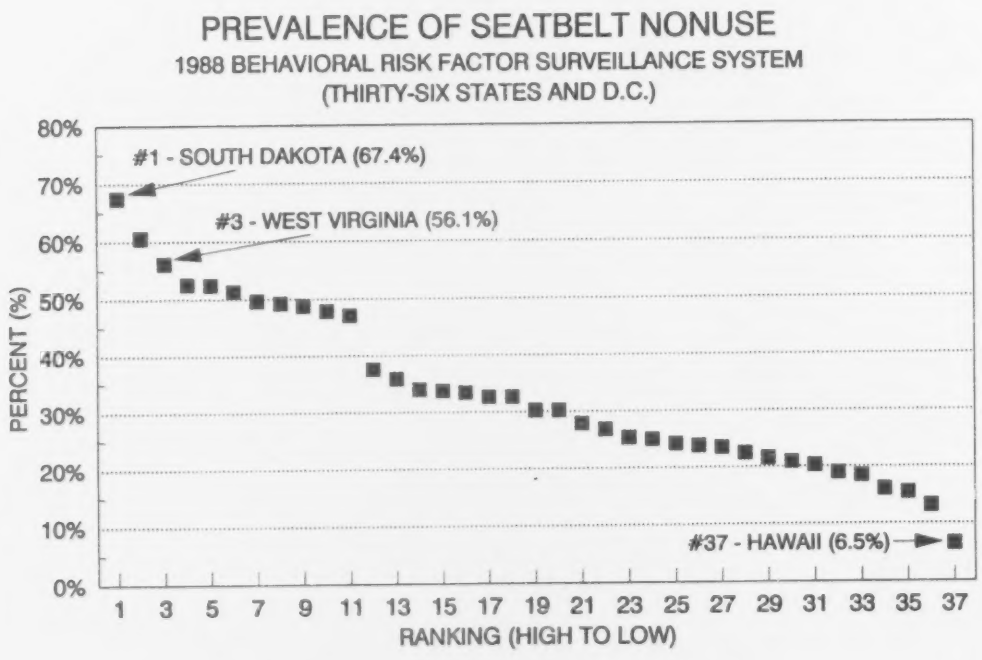
[2] Arkin, Herbert, and Raymond R. Colton. Statistical Methods. New York: Barnes & Noble, 1965.

SEATBELT NONUSE

Respondents to the 1988 BRFS were asked if they used seatbelts according to the following categories: (a) always; (b) nearly always; (c) sometimes; (d) seldom, and (e) never. Fifty-six percent (56%) of the respondents reported in 1988 that they used seatbelts only sometimes, seldom, or never, compared to 59% in 1987. West Virginia ranked third in seatbelt nonuse among the 37 1988 BRFSS participants (Figure 1).

FIGURE 1



Men reported more nonuse than women (61% vs. 51%) (Table 1). The lowest rate of nonuse among women was found among those aged 25-34 (44%), while men aged 35-44 reported the lowest prevalence (50%). The prevalence of seatbelt nonuse declined substantially

Table 1

PREVALENCE OF SEATBELT NONUSE BY SELECTED CHARACTERISTICS
1988 West Virginia Behavioral Risk Factor Survey

CHARACTERISTIC	MEN	WOMEN	TOTAL
	61.3	51.4	56.1
Age			
18-24	66.7	47.7	57.1
25-34	63.1	43.9	53.5
35-44	49.6	51.4	50.5
45-54	55.9	54.7	55.2
55-64	71.9	59.9	65.5
65+	59.2	53.8	56.0
Education			
<12 Years	80.5	64.1	71.8
12 Years	65.2	53.9	59.3
13-15 Years	52.7	41.6	46.7
16+ Years	27.9	32.7	30.4
Income			
<$10,000	76.1	60.0	66.6
$10,000-$24,999	66.5	53.7	59.5
$25,000+	50.5	37.7	44.8
Unknown	49.7	54.6	52.4

with higher educational attainment for both sexes, with 70% of adults having college degrees being regular seatbelt users. The prevalence also declined with increased household income.

Seatbelt nonuse decreased in all of the 15 states that participated in the BRFSS from 1984 through 1988 (Table 2). Marked declines in prevalence can be noted for the eleven states in which mandatory belt-use laws were enacted during the time period. Lesser declines were experienced in the four states that

did not enact such legislation: West Virginia, South Carolina, Rhode Island, and Arizona. According to the method of least squares, calculated to estimate the average annual change in prevalence in each state, West Virginia reported the smallest average decline per year (7%).

Table 2

SEATBELT NONUSE PREVALENCE BY YEAR
Behavioral Risk Factor Surveillance System
1984-1988

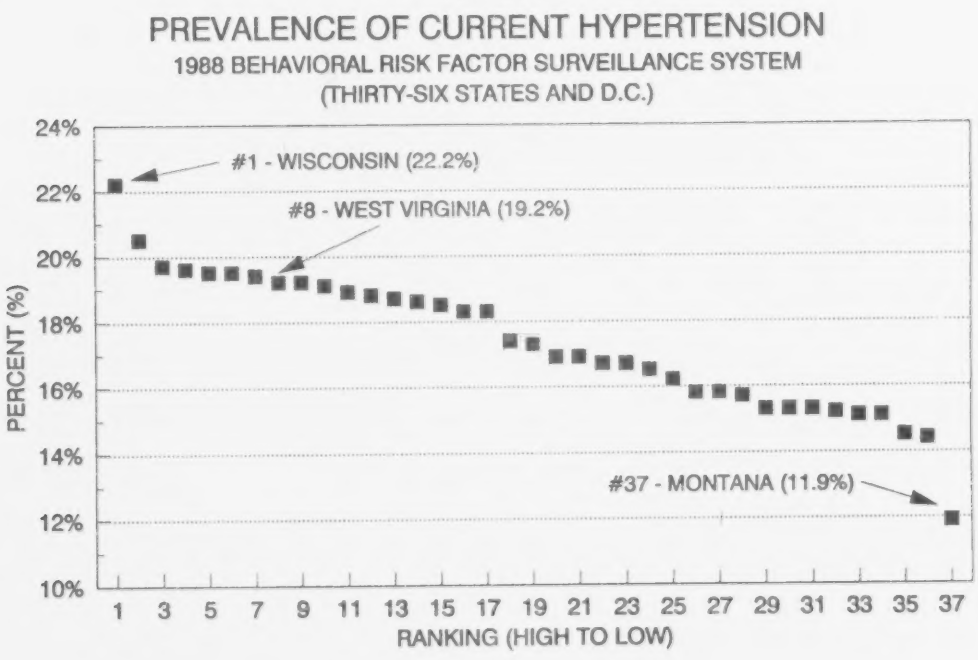
	1984	1985	1986	1987	1988	% Change* 1984-88 +/-	Average % Change* Per Year 1984-88 +/-
**West Virginia	75.9	70.9	61.9	59.2	56.1	-27.3	-6.8
**Arizona	61.1	54.1	44.1	43.9	35.8	-40.6	-10.1
California	51.2	47.0	20.2	19.1	18.4	-75.0	-18.7
Idaho	71.0	65.8	51.2	42.1	37.5	-50.6	-12.7
Illinois	68.2	49.6	35.4	37.8	32.5	-54.3	-13.6
Indiana	73.3	69.2	59.1	42.2	30.1	-58.6	-14.6
Minnesota	71.0	65.0	48.3	36.4	26.7	-64.3	-16.1
Montana	70.8	67.5	61.8	49.7	30.1	-52.3	-13.1
North Carolina	71.3	54.8	30.6	13.9	13.1	-92.3	-23.1
Ohio	68.6	58.2	35.4	27.0	27.8	-68.4	-17.1
**Rhode Island	71.4	69.9	59.4	52.6	47.0	-36.1	-9.0
**South Carolina	66.6	65.6	52.4	52.4	48.7	-29.3	-7.3
Tennessee	71.8	65.1	50.6	33.8	32.5	-60.4	-15.1
Utah	66.8	61.4	47.4	39.2	33.3	-52.9	-13.2
Wisconsin	67.9	64.0	61.9	54.0	23.4	-53.5	-13.4

*Percentage change calculated by least-squares analysis.
**Did not have mandatory seatbelt-use legislation enacted during report period.

CURRENT HYPERTENSION

The rate of current hypertension among West Virginia adults during 1988 was 19%, a decrease from the 1987 prevalence of 25%. The state ranked eighth among the 37 participants in the 1988 BRFSS (Figure 2). Respondents were defined as being current hypertensives if they reported at least one of the following criteria: (a) they had been told they had high blood pressure on two or more occasions; (b) they had antihypertensive medication currently prescribed, or (c) they reported that their blood pressure was "still high" at the time of their interview.

FIGURE 2



While women had a higher rate of hypertension overall than men (20% vs. 18%), men reported a higher prevalence than women for all age groups under 55 (Table 3). The prevalence of hypertension

Table 3

PREVALENCE OF CURRENT HYPERTENSION BY SELECTED CHARACTERISTICS
1988 West Virginia Behavioral Risk Factor Survey

CHARACTERISTIC	MEN	WOMEN	TOTAL
	18.1	20.2	19.2
Age			
18-24	2.2	0.5	1.3
25-34	9.3	5.5	7.4
35-44	18.6	13.9	16.2
45-54	22.0	20.8	21.4
55-64	26.4	33.7	30.3
65+	39.5	47.5	44.2
Education			
<12 Years	29.0	36.9	33.2
12 Years	12.0	15.7	14.0
13-15 Years	15.2	10.5	12.7
16+ Years	19.2	13.3	16.2
Income			
<$10,000	24.4	29.0	27.1
$10,000-$24,999	18.0	18.6	18.3
$25,000+	14.9	11.5	13.4
Unknown	16.9	25.0	21.4

rose with increasing age, with 44% of respondents 65 years and over reporting being hypertensive. No pattern was ascertained between hypertension and education; however, prevalence was highest (33%) among adults having less than 12 years of education. While the overall prevalence of hypertension declined with higher family income levels, this association was stronger among women than men.

Of the 15 1984-88 BRFSS participants, nine experienced upward

trends in current hypertension prevalence over the five-year period, while six had downward trends (Table 4). The largest average annual increase in hypertension prevalence from 1984-88, as estimated by a least-squares trend analysis, was reported by Utah (8%), while the greatest average annual decrease was demonstrated by Montana (6%). Current hypertension prevalence among adult West Virginians showed an overall downward trend from 1984 to 1988, with an average annual decrease of 2%.

Table 4

CURRENT HYPERTENSION PREVALENCE BY YEAR
Behavioral Risk Factor Surveillance System
1984-1988

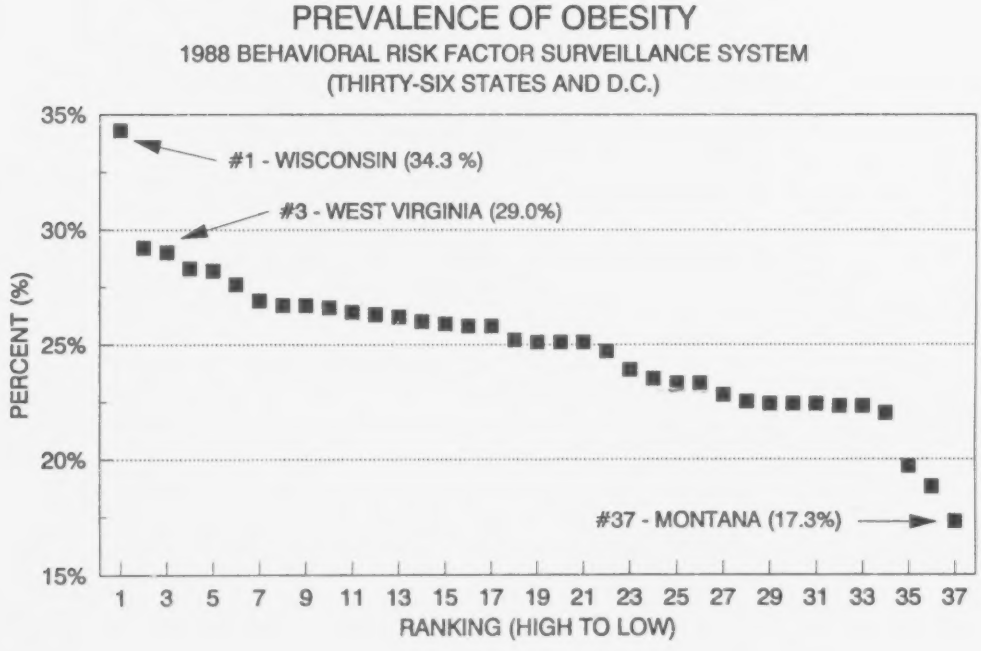
	1984	1985	1986	1987	1988	% Change* 1984-88 +/-	Average % Change* Per Year 1984-88 +/-
West Virginia	23.7	21.2	22.3	25.2	19.2	-8.6	-2.1
Arizona	15.8	16.9	14.3	20.8	16.2	+11.9	+3.0
California	16.2	17.0	16.2	20.7	15.2	+4.1	+1.0
Idaho	17.5	15.7	15.3	21.2	15.7	+4.6	+1.1
Illinois	20.3	17.5	18.4	22.2	18.7	+3.1	+0.8
Indiana	17.9	20.4	19.0	23.4	20.5	+17.6	+4.4
Minnesota	17.1	15.4	16.0	22.3	16.9	+16.0	+4.0
Montana	16.2	15.1	15.4	14.3	11.9	-22.8	-5.7
North Carolina	22.1	17.5	17.5	20.6	16.7	-15.1	-3.8
Ohio	20.9	17.3	17.0	22.4	17.4	-3.9	-1.0
Rhode Island	18.7	19.2	19.6	17.9	15.3	-16.4	-4.1
South Carolina	18.4	18.3	18.9	23.9	18.6	+13.0	+3.3
Tennessee	21.5	20.1	19.6	23.9	19.5	-0.4	-0.1
Utah	15.3	14.5	16.2	18.2	19.4	+33.2	+8.3
Wisconsin	18.1	19.9	15.5	22.2	22.2	+24.0	+6.0

*Percentage change calculated by least-squares analysis.

OBESITY

Respondents to the 1988 BRFS were questioned concerning their height and weight. Using the 1959 Metropolitan Life Insurance Company's height and weight tables, CDC calculated each individual's "ideal weight*." Individuals whose weight was at least 20% over their ideal weight were judged to be obese. The state's overall prevalence of obesity during 1988 was 29%, with West Virginia ranking third among the 37 BRFSS participants (Figure 3).

FIGURE 3


PREVALENCE OF OBESITY
1988 BEHAVIORAL RISK FACTOR SURVEILLANCE SYSTEM
(THIRTY-SIX STATES AND D.C.)
35%
30%
25%
20%
15%
PERCENT (%)
#1 - WISCONSIN (34.3 %)
#3 - WEST VIRGINIA (29.0%)
#37 - MONTANA (17.3%)
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37
RANKING (HIGH TO LOW)

Men reported higher prevalences of obesity overall (33% vs. 26%) and in all age ranges under the age of 55, while women aged

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*Medium frame assumed.

55 and over were more likely to be obese (Table 5). Obesity prevalence increased with increasing age overall and among men until age 55, after which it declined. Among women, obesity increased until age 65. There was no association for either sex between educational attainment and obesity. The prevalence of obesity increased with household income levels among men, while it decreased among women.

From 1984 to 1988, 14 of the 15 original BRFSS participants experienced increases in obesity prevalence (Table 6). According

Table 5

PREVALENCE OF OBESITY BY SELECTED CHARACTERISTICS
1988 West Virginia Behavioral Risk Factor Survey

CHARACTERISTIC	MEN	WOMEN	TOTAL
	32.7	25.6	29.0
Age			
18-24	14.2	12.7	13.4
25-34	39.5	13.5	26.4
35-44	41.5	29.6	35.4
45-54	44.4	32.9	38.3
55-64	30.8	38.8	35.1
65+	26.6	31.9	29.7
Education			
<12 Years	28.8	36.8	33.1
12 Years	34.6	24.3	29.2
13-15 Years	27.8	13.6	20.1
16+ Years	42.1	24.4	33.1
Income			
<$10,000	26.4	30.2	28.6
$10,000-$24,999	35.5	27.6	31.2
$25,000+	35.9	18.2	28.0
Unknown	24.2	25.0	24.7

Table 6

OBESITY PREVALENCE BY YEAR
Behavioral Risk Factor Surveillance System
1984-1988

	1984	1985	1986	1987	1988	% Change* 1984-88 +/-	Average % Change* Per Year 1984-88 +/-
West Virginia	25.7	27.4	27.7	27.6	29.0	+10.4	+2.6
Arizona	20.4	20.2	18.3	20.3	22.4	+8.4	+2.1
California	18.6	17.7	21.5	21.4	25.1	+37.6	+9.4
Idaho	21.8	20.7	22.9	23.9	22.8	+9.7	+2.4
Illinois	23.2	22.5	22.0	26.3	26.6	+19.3	+4.8
Indiana	23.7	27.6	25.2	28.8	29.2	+20.0	+5.0
Minnesota	20.7	20.4	22.3	25.3	25.2	+27.8	+6.9
Montana	19.9	20.3	21.2	19.1	17.3	-12.3	-3.1
North Carolina	23.4	19.5	25.2	23.8	24.7	+12.6	+3.1
Ohio	25.7	25.9	23.7	28.9	25.9	+5.4	+1.3
Rhode Island	19.2	21.1	25.0	20.4	22.4	+11.1	+2.8
South Carolina	21.9	23.2	24.2	25.2	25.8	+17.7	+4.4
Tennessee	21.4	22.0	22.7	25.6	25.1	+20.8	+5.2
Utah	17.4	17.7	17.4	19.7	22.4	+29.1	+7.3
Wisconsin	24.6	26.6	28.7	28.5	34.3	+35.1	+8.8

*Percentage change calculated by least-squares analysis.

to a least-squares analysis performed to ascertain prevalence trends for each state, California led the other participants in the largest average percentage increase per year (9%). West Virginia had an annual average increase in obesity prevalence of 3% over the five years. Montana was the only state to report a decline in obesity from 1984-88, showing an average annual decrease of 3%.

SEDENTARY LIFESTYLE

The 1988 BRFSS questionnaire categorized respondents into four groups according to the following physical activity levels (recreational or nonwork-related activities):

(1) 1990 Objectives - Those who met the 1990 Health Objectives for the Nation by exercising at 60% of functional capacity for 20 minutes or more, three or more times a week.

(2) Regular Activity - Those who had regular activity 20 minutes or more, three or more times a week, but who exercised at less than 60% of functional capacity.

(3) Irregular Activity - Those who performed a physical activity less than 20 minutes, or less than three times a week.

(4) Sedentary - Those who reported no physical activity.

For the purposes of this report, sedentary lifestyle refers to the last two levels. The 1988 rate of sedentary lifestyle among resident adults was 66%, up from 64% in 1987. West Virginia ranked fifth among the 37 states participating in the 1988 BRFSS (Figure 4).

Women were more likely to report having a sedentary lifestyle than were men overall (68% vs. 64%) and among ages 18-24 and over 55 (Table 7). The prevalence of sedentary lifestyle increased among men through age 54, after which it declined. The overall rate of sedentary lifestyle declined with increased educational attainment, with a stronger association observed among women than men. Prevalence was highest among respondents reporting the

FIGURE 4

PREVALENCE OF SEDENTARY LIFESTYLE

1988 BEHAVIORAL RISK FACTOR SURVEILLANCE SYSTEM
(THIRTY-FIVE STATES AND D.C.)

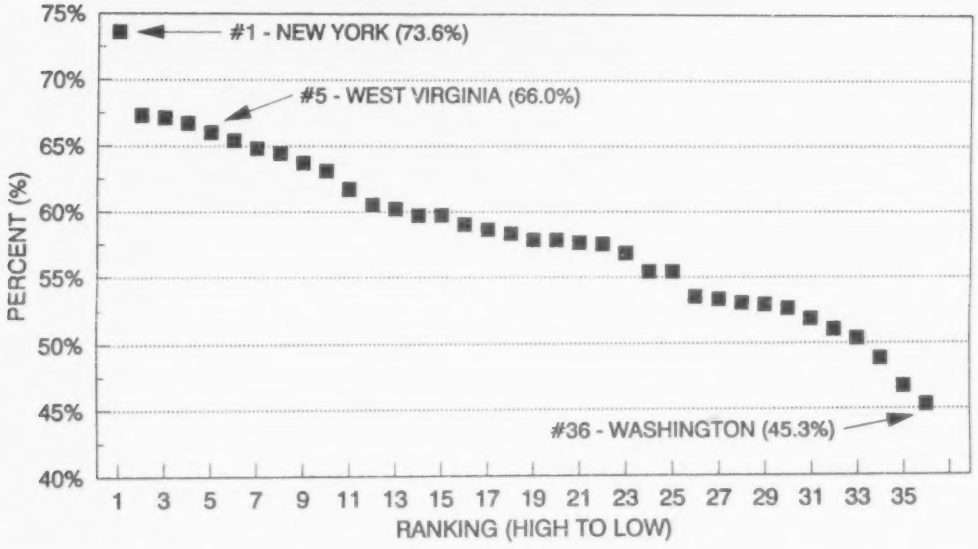


Table 7

PREVALENCE OF SEDENTARY LIFESTYLE BY SELECTED CHARACTERISTICS
1988 West Virginia Behavioral Risk Factor Survey

CHARACTERISTIC	MEN	WOMEN	TOTAL
	63.8	67.9	66.0
Age			
18-24	54.6	69.5	62.2
25-34	62.0	60.4	61.2
35-44	66.2	59.0	62.6
45-54	75.1	70.7	72.8
55-64	64.7	68.9	67.0
65+	63.7	78.4	72.3
Education			
<12 Years	77.8	83.0	80.5
12 Years	65.0	70.2	67.7
13-15 Years	49.1	56.2	53.0
16+ Years	52.8	47.3	50.0
Income			
<$10,000	76.0	77.3	76.8
$10,000-$24,999	63.9	69.2	66.8
$25,000+	54.3	53.1	53.8
Unknown	72.5	75.6	74.2

lowest household income and decreased with higher income levels among both sexes.

As shown in Table 8, sedentary lifestyle prevalence increased in 14 of the 15 states that participated in the surveillance over the five-year period from 1984-88. Trends over the five-year period were estimated using a least-squares analysis. West Virginia had an overall increase of 9% in sedentary lifestyle, an average annual increase of 2%. Arizona had the largest average increase per year (9%), followed by North Carolina (6%). Montana, with an average annual decrease of 0.9%, was the only state to report a downward trend in sedentary lifestyle prevalence.

Table 8

SEDENTARY LIFESTYLE PREVALENCE BY YEAR
Behavioral Risk Factor Surveillance System
1984-1988

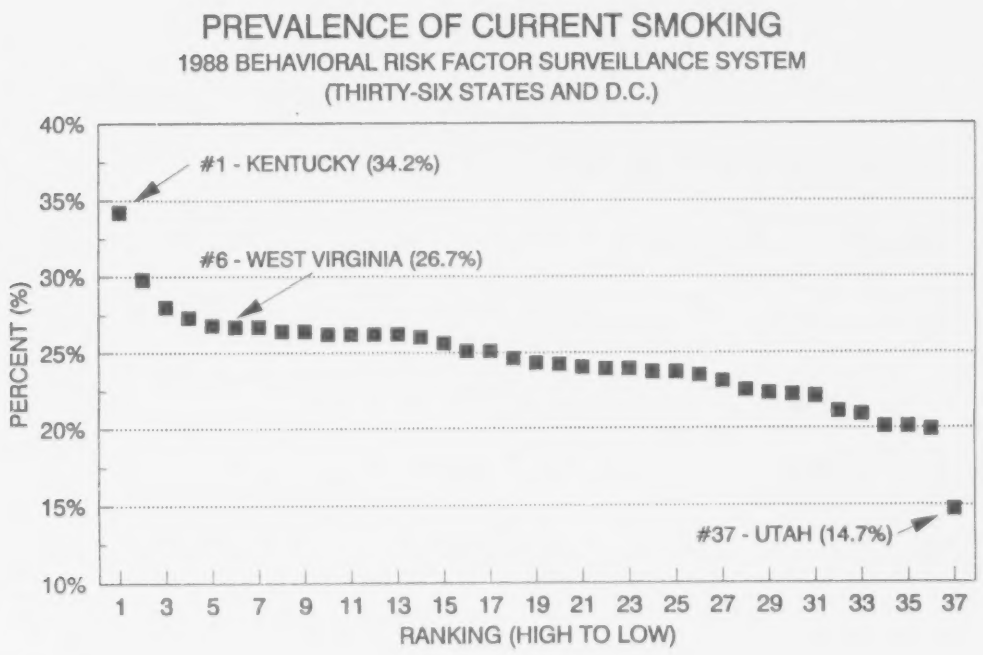
	1984	1985	1986	1987	1988	% Change* 1984-88 +/-	Average % Change* Per Year 1984-88 +/-
West Virginia	60.7	61.7	60.9	64.2	66.0	+8.7	+2.2
Arizona	39.5	46.1	49.9	57.4	53.0	+36.9	+9.2
California	42.2	53.5	58.0	53.2	48.8	+10.6	+2.7
Idaho	46.3	44.2	51.8	55.1	51.0	+17.8	+4.4
Illinois	53.8	52.4	64.9	57.4	57.8	+9.5	+2.4
Indiana	53.7	64.5	59.4	59.8	60.2	+5.7	+1.4
Minnesota	49.4	55.7	54.6	56.6	53.5	+7.0	+1.7
Montana	50.0	45.0	48.7	47.2	46.7	-3.6	-0.9
North Carolina	50.1	57.7	61.9	61.3	63.7	+23.3	+5.8
Ohio	52.5	61.3	58.1	67.1	63.1	+19.6	+4.9
Rhode Island	59.9	65.1	65.6	68.7	64.8	+8.6	+2.2
South Carolina	54.9	64.5	66.5	60.5	65.4	+11.5	+2.9
Tennessee	60.9	67.8	65.5	66.5	67.3	+7.3	+1.8
Utah	42.7	47.5	49.1	49.9	50.3	+15.9	+4.0
Wisconsin	50.4	53.5	54.9	54.0	55.4	+8.1	+2.0

*Percentage change calculated by least-squares analysis.

CURRENT SMOKING

The 1988 prevalence of current cigarette smoking among West Virginia adults was 27%, slightly lower than the 1987 prevalence of 29%. West Virginia ranked sixth in smoking prevalence among the 37 1988 BRFSS participants (Figure 5). Men reported a slightly higher overall rate of smoking than did women (28% vs. 26%), although prevalence was higher among women aged 25-44. There was no observable pattern between age and smoking; however, prevalence was lowest (15%) among respondents aged 65+. Men reported their highest rate among ages 55-64, while the highest prevalence among women was reported by those aged 25-34 (Table 9).

FIGURE 5



A strong association was noted for both sexes between education and smoking, with prevalence decreasing as educational

attainment increased (Table 9). Overall prevalence also declined with increasing income level, a relationship more discernible among men than women.

Table 9

PREVALENCE OF CURRENT SMOKING BY SELECTED CHARACTERISTICS
1988 West Virginia Behavioral Risk Factor Survey

CHARACTERISTIC	MEN	WOMEN	TOTAL
	27.8	25.7	26.7
Age			
18-24	21.6	18.8	20.2
25-34	30.6	31.6	31.1
35-44	28.8	29.4	29.1
45-54	35.4	31.2	33.2
55-64	38.2	27.9	32.6
65+	13.5	16.6	15.3
Education			
<12 Years	36.1	30.8	33.3
12 Years	29.2	27.6	28.3
13-15 Years	20.9	21.2	21.1
16+ Years	18.0	16.0	17.0
Income			
<$10,000	39.2	28.7	33.0
$10,000-$24,999	25.7	28.7	27.4
$25,000+	23.5	22.9	23.2
Unknown	27.5	14.0	19.9

The method of least squares was employed to estimate the trend of current smoking prevalence for each of the 15 original BRFSS states from 1984 through 1988 (Table 10). Fourteen of the 15 states reported downward trends in smoking prevalence. West Virginia experienced an average annual decline of 3%. Montana

reported the largest annual average decline (7%); Tennessee was the only state showing an upward trend in smoking prevalence.

Table 10

CURRENT SMOKING PREVALENCE BY YEAR
Behavioral Risk Factor Surveillance System
1984-1988

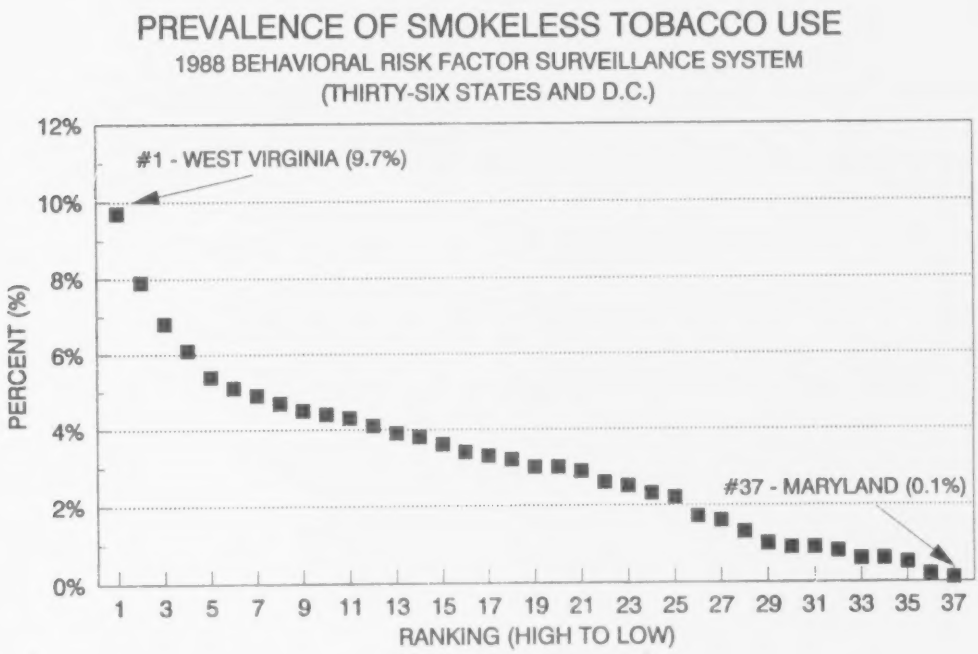
	1984	1985	1986	1987	1988	% Change* 1984-88 +/-	Average % Change* Per Year 1984-88 +/-
West Virginia	32.8	26.7	29.1	28.8	26.7	-13.1	-3.3
Arizona	27.7	26.4	24.4	26.2	23.5	-12.6	-3.1
California	25.6	25.6	24.5	21.3	22.2	-17.0	-4.3
Idaho	24.5	23.7	23.4	20.5	20.1	-19.3	-4.8
Illinois	33.6	26.2	27.8	25.8	26.8	-18.2	-4.5
Indiana	N/A	32.2	27.2	28.7	27.3	-12.8	-4.3
Minnesota	26.5	27.8	25.1	24.3	22.5	-16.7	-4.2
Montana	28.9	24.6	23.0	22.3	19.9	-29.2	-7.3
North Carolina	N/A	27.4	26.5	26.1	26.6	-3.1	-0.8
Ohio	28.7	28.7	28.0	26.8	26.2	-9.5	-2.4
Rhode Island	31.3	29.4	30.2	24.3	24.3	-24.1	-6.0
South Carolina	26.2	29.2	26.5	25.3	25.6	-7.4	-1.8
Tennessee	N/A	27.5	28.0	27.7	29.8	+7.3	+2.4
Utah	16.1	15.6	18.2	15.0	14.7	-8.2	-2.0
Wisconsin	27.4	24.6	26.0	26.0	23.1	-10.7	-2.7

*Percentage change calculated by least-squares analysis.
N/A = Not available

SMOKELESS TOBACCO USE

Smokeless tobacco includes tobacco products such as chewing tobacco and snuff that are taken orally instead of inhaled. In 1988, the prevalence of smokeless tobacco use in West Virginia was almost 10%, compared to 8% in 1987. The state maintained its rank of first among all the BRFSS participants in smokeless tobacco use (Figure 6).

FIGURE 6



Almost 20% of adult men in West Virginia reported using smokeless tobacco in 1988, while less than 1% of women did so. (Only data on men will be presented in this section because the prevalence among women was so low.) Smokeless tobacco use declined with age, from a high of 37% among men aged 18-24 to a

low of 10% among men over the age of 65 (Table 11). While no discernable pattern was observed between education and smokeless tobacco use, the lowest prevalence was reported by men who were college graduates (9%). The prevalence of smokeless tobacco use declined with increasing household income level.

Questions on smokeless tobacco use were not included in the Behavioral Risk Factor Survey until 1986. It was not possible to ascertain trends with only three years of data available; however, future reports will include this information.

Table 11

PREVALENCE OF SMOKELESS TOBACCO USE BY SELECTED CHARACTERISTICS
1988 West Virginia Behavioral Risk Factor Survey

CHARACTERISTIC	MEN
	19.5
Age	
18-24	37.4
25-34	18.2
35-44	18.2
45-54	18.0
55-64	11.8
65+	9.6
Education	
<12 Years	21.1
12 Years	22.8
13-15 Years	19.1
16+ Years	8.7
Income	
<$10,000	25.6
$10,000-$24,999	22.8
$25,000+	13.7
Unknown	15.6

ALCOHOL MISUSE

Heavier Drinking

"Heavier drinking" is defined as alcohol consumption averaging two or more drinks a day. The 1988 prevalence was slightly lower than that reported the previous year (4.3% vs. 4.7%). West Virginia ranked 30th among the 37 1988 BRFSS participants in heavier drinking prevalence (Figure 7).

In 1988, 8% of adult men reported being heavier drinkers, compared to only 1% of the women (Table 12). Men aged 18-24 had the highest prevalence (20%), with no discernible pattern noted by age thereafter for either sex. Rates for women were low across all age ranges. No association was determined between either educational attainment or household income level and heavier drinking.

FIGURE 7

PREVALENCE OF HEAVIER DRINKING
1988 BEHAVIORAL RISK FACTOR SURVEILLANCE SYSTEM
(THIRTY-SIX STATES AND D.C.)

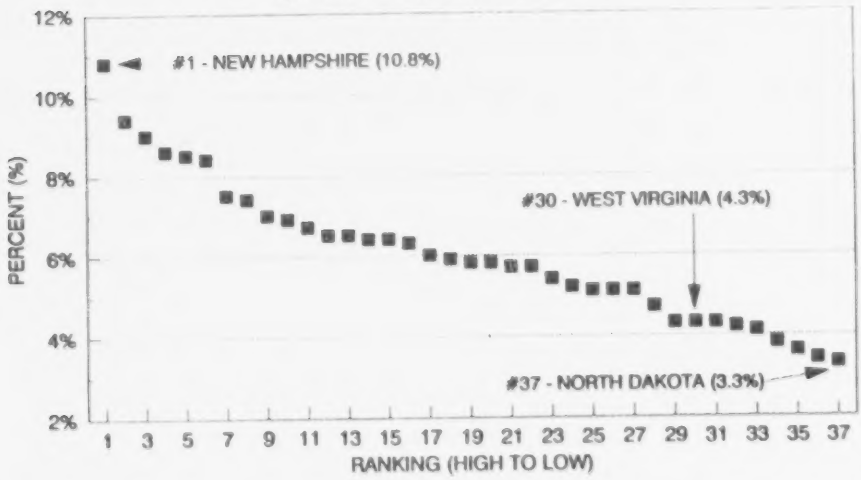


Table 12

PREVALENCE OF HEAVIER DRINKING BY SELECTED CHARACTERISTICS
1988 West Virginia Behavioral Risk Factor Survey

CHARACTERISTIC	MEN	WOMEN	TOTAL
	8.0	0.9	4.3
Age			
18-24	19.7	1.5	10.5
25-34	8.9	1.2	5.1
35-44	5.8	0.5	3.1
45-54	2.0	1.6	1.8
55-64	3.4	0.6	1.9
65+	4.8	-	2.0
Education			
<12 Years	2.5	1.5	2.0
12 Years	10.3	0.8	5.3
13-15 Years	12.5	1.0	6.3
16+ Years	6.9	-	3.4
Income			
<$10,000	7.8	-	3.2
$10,000-$24,999	8.6	1.4	4.7
$25,000+	8.4	0.8	5.1
Unknown	5.1	1.7	3.2

From 1984 to 1988, heavier drinking prevalence declined in 14 of the 15 original BRFSS participants (Table 13). A least-squares trend analysis was performed to determine the percentage change in prevalence over the five-year period for each state, as well as the average annual change. West Virginia experienced a 27% decline in heavier drinking prevalence from 1984-88, an average decline per year of 7%. Illinois reported the largest average annual decrease (12%), while Utah was the sole state to experience an increase in heavier drinking behavior (5% per year).

Table 13

HEAVIER DRINKING PREVALENCE BY YEAR
Behavioral Risk Factor Surveillance System
1984-1988

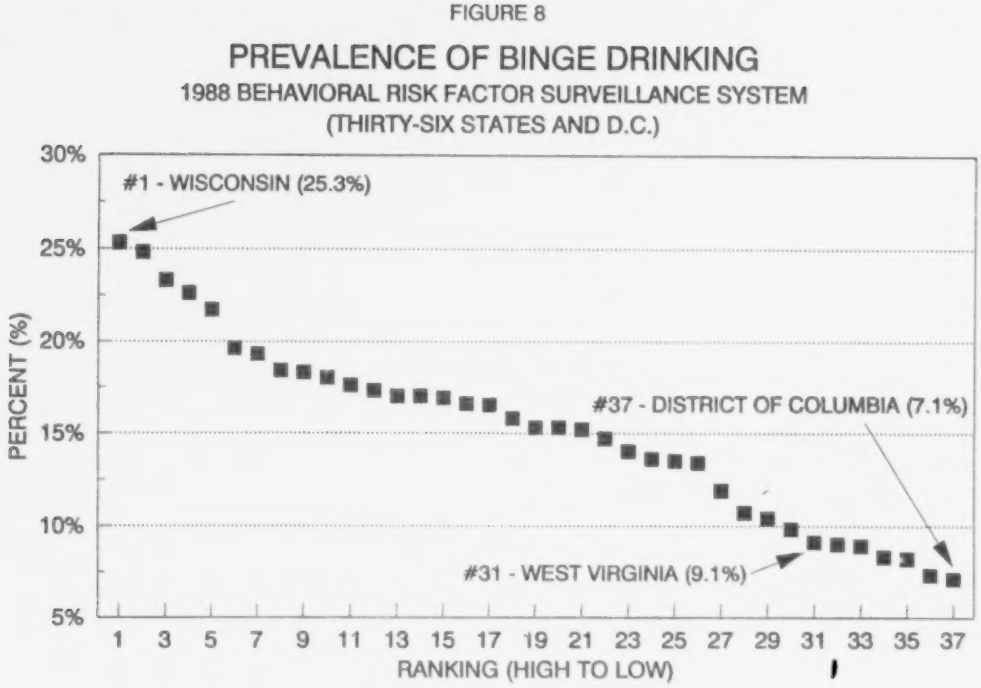
	1984	1985	1986	1987	1988	% Change* 1984-88 +/-	Average % Change* Per Year 1984-88 +/-
West Virginia	5.7	4.6	5.2	3.7	4.3	-27.2	-6.8
Arizona	12.0	9.3	8.3	8.0	6.4	-44.2	-11.1
California	10.5	8.2	7.8	8.9	8.4	-14.8	-3.7
Idaho	5.8	5.9	5.7	5.0	4.3	-25.5	-6.4
Illinois	10.2	10.9	8.1	6.5	5.7	-48.9	-12.2
Indiana	8.1	4.9	7.6	3.8	5.1	-38.8	-9.7
Minnesota	7.7	6.6	7.6	6.7	6.7	-10.2	-2.6
Montana	6.9	5.9	4.6	4.5	6.4	-15.6	-3.9
North Carolina	6.8	4.9	5.2	4.4	5.1	-25.7	-6.4
Ohio	8.7	7.5	9.4	6.3	6.3	-27.1	-6.8
Rhode Island	8.6	6.1	7.4	6.9	5.8	-24.2	-6.1
South Carolina	5.7	5.2	4.0	5.6	4.3	-17.6	-4.4
Tennessee	4.8	5.0	3.7	4.1	4.7	-9.4	-2.4
Utah	3.2	3.0	4.3	4.3	3.4	+20.6	+5.2
Wisconsin	10.3	9.4	10.8	9.7	8.6	-11.9	-3.0

*Percentage change calculated by least-squares analysis.

Binge Drinking

Nine percent (9%) of the respondents to the 1988 BRFS reported being "binge drinkers," i.e., having had five or more drinks of alcohol on at least one occasion during the previous month, a marked decrease from the 13% prevalence reported in 1987. West Virginia ranked 31st in binge drinking among the 37 1988

FIGURE 8


PREVALENCE OF BINGE DRINKING
1988 BEHAVIORAL RISK FACTOR SURVEILLANCE SYSTEM
(THIRTY-SIX STATES AND D.C.)
30%
25%
20%
15%
10%
5%
PERCENT (%)
#1 - WISCONSIN (25.3%)
#37 - DISTRICT OF COLUMBIA (7.1%)
#31 - WEST VIRGINIA (9.1%)
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37
RANKING (HIGH TO LOW)

BRFSS participants (Figure 8). Men reported much higher prevalences than women overall (15% vs. 4%) and across all age ranges (Table 14). Binge drinking prevalence decreased with age for both sexes. Among women, the rate of binge drinking increased with educational attainment, a pattern not observed among men. No association was established between household income level and binge drinking prevalences.

As with heavier drinking, binge drinking prevalence declined in 14 of the 15 states that participated in the BRFSS from 1984-88 (Table 15). According to the least-squares analysis that was calculated for each state, West Virginia's prevalence declined 17% from 1984-88, approximately 4% per year. The largest average annual decrease in binge drinking behavior was reported by Rhode Island (15%). Tennessee experienced an average annual increase of 6% in the prevalence of binge drinking.

Table 14

PREVALENCE OF BINGE DRINKING BY SELECTED CHARACTERISTICS
1988 West Virginia Behavioral Risk Factor Survey

CHARACTERISTIC	MEN	WOMEN	TOTAL
	15.3	3.5	9.1
Age			
18-24	39.9	8.1	23.8
25-34	16.6	7.2	11.9
35-44	15.2	2.0	8.5
45-54	6.0	1.3	3.5
55-64	3.0	0.6	1.7
65+	3.7	0.2	1.7
Education			
<12 Years	6.6	1.6	3.9
12 Years	15.6	3.0	9.0
13-15 Years	28.5	4.5	15.5
16+ Years	14.9	7.4	11.1
Income			
<$10,000	15.6	5.5	9.6
$10,000-$24,999	17.3	2.4	9.2
$25,000+	15.0	4.0	10.1
Unknown	8.4	1.2	4.3

Table 15

BINGE DRINKING PREVALENCE BY YEAR
Behavioral Risk Factor Surveillance System
1984-1988

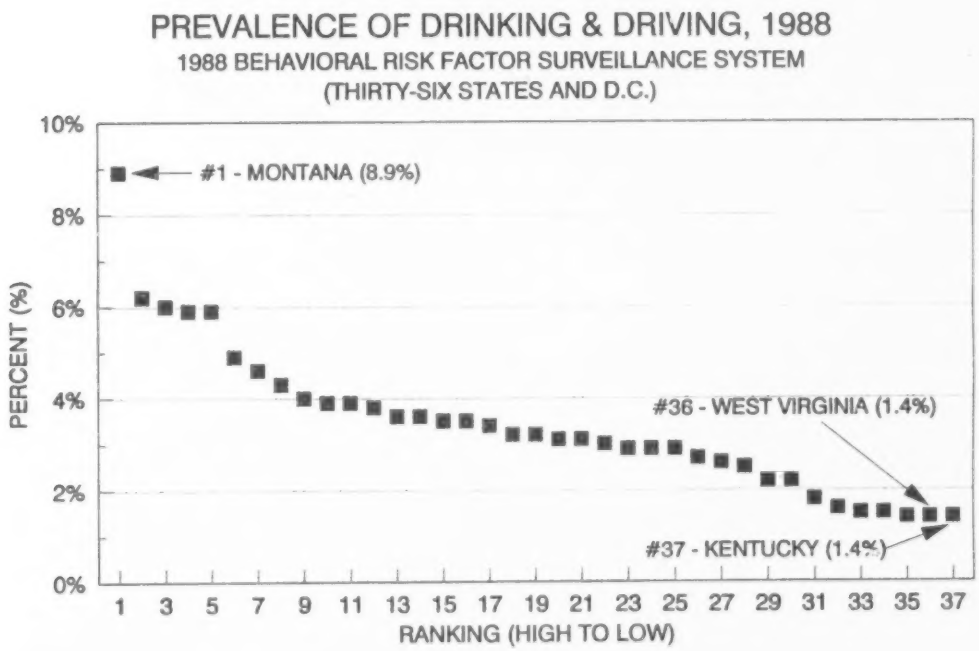
	1984	1985	1986	1987	1988	% Change* 1984-88 +/-	Average % Change* Per Year 1984-88 +/-
West Virginia	11.6	13.5	13.1	13.1	9.1	-16.7	-4.2
Arizona	20.8	19.0	16.7	17.6	16.6	-19.5	-4.9
California	20.4	17.3	17.1	17.8	15.8	-17.9	-4.5
Idaho	17.8	15.5	17.6	15.3	14.0	-17.9	-4.5
Illinois	22.8	21.2	19.6	14.1	18.0	-29.7	-7.4
Indiana	16.6	19.3	17.7	13.2	15.3	-19.2	-4.8
Minnesota	25.3	23.3	23.7	22.2	22.6	-10.5	-2.6
Montana	27.0	22.4	22.6	22.6	24.8	-6.8	-1.7
North Carolina	14.2	12.6	12.9	11.5	11.9	-16.6	-4.1
Ohio	22.5	19.8	20.2	17.0	17.0	-25.0	-6.3
Rhode Island	19.2	12.9	14.7	7.7	8.2	-60.5	-15.1
South Carolina	11.0	9.8	7.2	11.9	9.8	-1.2	-0.3
Tennessee	8.6	6.3	9.9	10.2	9.0	+23.9	+6.0
Utah	10.5	12.2	13.3	11.0	7.3	-24.6	-6.1
Wisconsin	28.9	27.3	29.6	29.4	25.3	-7.0	-1.8

*Percentage change calculated by least-squares analysis.

Drinking and Driving

Respondents to the 1988 BRFS were asked if they had driven when they had had "perhaps" too much to drink during the previous month. Drinking and driving prevalence decreased slightly from 1987 (2.2% vs. 1.4%), placing West Virginia 36th among the 37 1988 surveillance participants (Figure 9).

FIGURE 9


PREVALENCE OF DRINKING & DRIVING, 1988
1988 BEHAVIORAL RISK FACTOR SURVEILLANCE SYSTEM
(THIRTY-SIX STATES AND D.C.)
10%
8%
6%
4%
2%
0%
PERCENT (%)
#1 - MONTANA (8.9%)
#36 - WEST VIRGINIA (1.4%)
#37 - KENTUCKY (1.4%)
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37
RANKING (HIGH TO LOW)

The state prevalence was 2% among men and slightly less than 1% among women (Table 16). The highest overall prevalence by age was among respondents aged 18-24 (4%), with men in this age range reporting a rate of 7%. Drinking and driving prevalence increased among women with increasing educational level, an association not noted among men. Among men, drinking and driving decreased with higher income levels; among women, the prevalence increased with higher household income.

Table 16

PREVALENCE OF DRINKING AND DRIVING BY SELECTED CHARACTERISTICS
1988 West Virginia Behavioral Risk Factor Survey

CHARACTERISTIC	MEN	WOMEN	TOTAL
	2.1	0.9	1.4
Age			
18-24	7.1	2.0	4.5
25-34	1.3	0.9	1.1
35-44	0.4	0.9	0.7
45-54	1.0	-	0.5
55-64	-	1.3	0.7
65+	1.9	-	0.8
Education			
<12 Years	1.4	-	0.6
12 Years	0.4	0.2	0.3
13-15 Years	6.7	0.4	3.3
16+ Years	2.6	5.0	3.8
Income			
<$10,000	3.9	0.2	1.8
$10,000-$24,999	2.7	0.5	1.5
$25,000+	1.0	2.4	1.6
Unknown	-	-	-

Fourteen of the 15 original BRFSS participants reported an increase in drinking and driving prevalence from 1984 to 1988 (Table 17). Using a least-squares analysis, West Virginia showed an average decline of 11% per year in drinking and driving. Rhode Island reported the largest average decline in this behavior (14% per year), while the analysis of Montana's prevalence over the five years showed an average annual increase of 3%.

Table 17

DRINKING AND DRIVING PREVALENCE BY YEAR
Behavioral Risk Factor Surveillance System
1984-1988

	1984	1985	1986	1987	1988	% Change* 1984-88 +/-	Average % Change* Per Year 1984-88 +/-
West Virginia	2.9	2.8	2.9	2.2	1.4	-45.6	-11.4
Arizona	6.3	5.6	4.0	3.5	2.9	-57.1	-14.3
California	4.2	3.3	4.8	3.9	3.9	0.0	0.0
Idaho	4.2	3.3	3.6	2.3	3.2	-30.6	-7.7
Illinois	6.9	6.3	7.3	3.9	2.9	-55.2	-13.8
Indiana	4.7	3.8	4.5	2.4	3.5	-33.5	-8.4
Minnesota	6.9	6.8	5.6	6.2	5.9	-15.3	-3.8
Montana	8.2	5.5	6.6	6.3	8.9	+13.2	+3.3
North Carolina	4.6	3.7	3.5	1.7	3.1	-46.3	-11.6
Ohio	7.4	4.5	4.7	3.6	3.6	-52.6	-13.2
Rhode Island	5.0	3.0	2.8	1.7	2.6	-57.5	-14.4
South Carolina	2.0	3.3	2.6	3.5	1.4	-14.5	-3.6
Tennessee	3.3	1.7	2.0	2.6	2.2	-19.8	-5.0
Utah	3.9	2.5	3.4	2.1	1.5	-55.9	-14.0
Wisconsin	11.3	9.3	9.6	8.2	6.2	-40.4	-10.1

*Percentage change calculated by least-squares analysis.

COMPOSITE PREVALENCE SCORES

In addition to ranking the 37 1988 BRFSS participants on each of the nine individual risk factors, a single overall measure of unhealthful behavior was calculated for each state. This measure, called a composite weighted Z-score, is based on models developed by the National Center for Health Statistics and described in "The NWNL State Health Rankings"[3] published by Northwestern National Life Insurance Co. The composite weighted Z-score is calculated by combining scores derived from each state's prevalences for seven designated risk factors, or components: (1) seatbelt nonuse; (2) current hypertension; (3) obesity; (4) sedentary lifestyle; (5) current smoking; (6) smokeless tobacco use, and (7) alcohol misuse (a single component calculated from prevalences for heavier drinking, binge drinking, and drinking and driving).

A Z-score for each of the seven risk factor components was obtained for each BRFSS participant by calculating the number of standard deviations its prevalence fell above or below the mean prevalence for a given risk factor. A weighted Z-score, or the product of the Z-score and the coefficient of variation (the standard deviation divided by the mean), was then calculated for each component. The sum of the weighted Z-scores for all seven components gave each state its final composite score. Table 18 lists the 37 states from highest (most unhealthy behaviors) to lowest (fewest unhealthy behaviors) score. West Virginia had by

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[3]Northwestern National Life Insurance Company. The 1989 NWNL State Health Rankings. Minneapolis, MN:NWNL, 1989.

Table 18

COMPOSITE PREVALENCE SCORE RANKINGS
1988 Behavioral Risk Factor Surveillance System

State	Composite Weighted Z-Score	Rank
West Virginia	2.81	1
Kentucky	1.73	2
South Dakota	1.72	3
Alabama	1.45	4
North Dakota	1.17	5
Montana	1.15	6
Nebraska	1.08	7
South Carolina	0.81	8
Wisconsin	0.62	9
Tennessee	0.57	10
Indiana	0.50	11
Oklahoma	0.47	12
Michigan	0.42	13
New Hampshire	0.32	14
Ohio	0.11	15
Minnesota	0.11	16
North Carolina	0.06	17
Maine	0.03	18
Massachusetts	-0.19	19
Georgia	-0.19	20
Missouri	-0.20	21
Illinois	-0.26	22
Arizona	-0.27	23
Idaho	-0.30	24
Texas	-0.34	25
Florida	-0.51	26
New Mexico	-0.68	27
Iowa	-0.71	28
Connecticut	-0.78	29
Rhode Island	-0.79	30
Washington	-0.91	31
New York	-1.12	32
California	-1.21	33
District of Columbia	-1.47	34
Hawaii	-1.69	35
Maryland	-1.73	36
Utah	-1.79	37

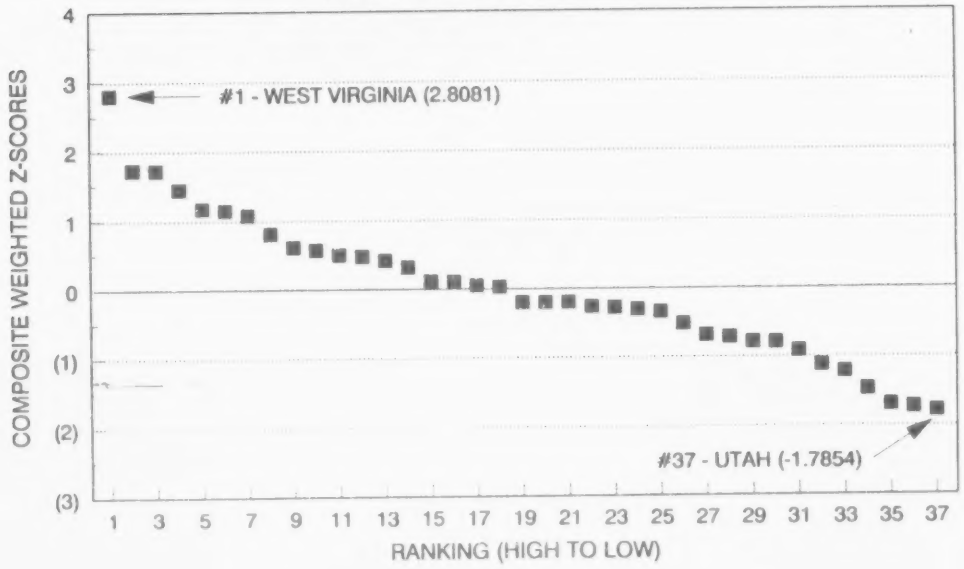
far the highest composite score of the 37 BRFSS states in 1988 (Figure 10), while Utah had the lowest score. Figure 11 shows the composite prevalence scores of the states by geographic distribution.

FIGURE 10

COMPOSITE PREVALENCE SCORE RANKINGS

1988 BEHAVIORAL RISK FACTOR SURVEILLANCE SYSTEM

(THIRTY-SIX STATES AND D.C.)



One weakness inherent in this type of analysis is the assumption of equal weighting for each risk factor or component. It is acknowledged that some behaviors might be more harmful to an individual's health than others. For the purposes of this report, however, it was decided that equal weighting was a valid procedure in demonstrating the variance of risk-taking behaviors from state to state. Future studies will explore alternative weighting methods.

FIGURE 11

COMPOSITE BEHAVIORAL RISK FACTOR PREVALENCE SCORES

UNITED STATES, 1988

Appendix A

BEHAVIORAL RISK FACTOR PREVALENCES BY YEAR
West Virginia Behavioral Risk Factor Surveys
1984-1988

Behavioral Risk Factor	1984 (15 States)	1985 (22 States)	1986 (26 States)	1987 (32 States)	1988
	% (Rank)	% (Rank)	% (Rank)	% (Rank)	%
Seatbelt Nonuse	75.9 (1)	70.9 (2)	61.9 (4)	59.2 (4)	56.1
Current Hypertension	23.7 (1)	21.2 (2)	22.3 (1)	25.2 (1)	19.2
Obesity	25.7 (1)	27.4 (2)	27.7 (2)	27.6 (4)	29.0
Sedentary Lifestyle	60.7 (2)	61.7 (6)	60.9 (10)	64.2 (6)	66.0
Current Smoking	32.8 (2)	26.7 (12)	29.1 (3)	28.8 (3)	26.7
Smokeless Tobacco Use	*	*	10.2 (1)	8.2 (1)	9.7
Heavier Drinking	5.7 (12)	4.6 (20)	5.2 (19)	3.7 (32)	4.3
Binge Drinking	11.6 (12)	13.6 (16)	13.1 (19)	13.1 (22)	9.1
Drinking & Driving	2.9 (14)	2.8 (18)	2.9 (19)	2.2 (23)	1.4

*Data not available.

Appendix B

Behavioral Risk Factor Prevalences (%) in 15 States
United States, 1984

State	Obesity	Sedentary Lifestyle	Current Hypertension	Current Smoking	Seatbelt Nonuse	Binge Drinking	Heavier Drinking	Drinking & Driving
	% (Rank)	% (Rank)	% (Rank)	% (Rank)	% (Rank)	% (Rank)	% (Rank)	% (Rank)
Arizona	20.4(11)	39.5(15)	15.8(14)	27.7 (6)	61.1(14)	20.8 (6)	12.0 (1)	6.3 (6)
California	18.6(14)	42.2(14)	16.2(12)	25.6(10)	51.2(15)	20.4 (7)	10.5 (2)	4.2(10)
Idaho	21.8 (8)	46.3(12)	17.5(10)	24.5(11)	71.0 (6)	17.8 (9)	5.8(11)	4.2(10)
Illinois	23.2 (6)	53.8 (5)	20.3 (5)	33.6 (1)	68.2(10)	22.8 (4)	10.2 (4)	6.9 (4)
Indiana	23.7 (4)	53.7 (6)	17.9 (9)	*	73.3 (2)	16.6(10)	8.1 (7)	4.7 (8)
Minnesota	20.7(10)	49.4(11)	17.1(11)	26.5 (8)	71.0 (6)	25.3 (3)	7.7 (8)	6.9 (4)
Montana	19.9(12)	50.0(10)	16.2(12)	28.9 (4)	70.8 (8)	27.0 (2)	6.9 (9)	8.2 (2)
North Carolina	23.4 (5)	50.1 (9)	22.1 (2)	*	71.3 (5)	14.2(11)	6.8(10)	4.6 (9)
Ohio	25.7 (1)	52.5 (7)	20.9 (4)	28.7 (5)	68.6 (9)	22.5 (5)	8.7 (5)	7.4 (3)
Rhode Island	19.2(13)	59.9 (3)	18.7 (6)	31.3 (3)	71.4 (4)	19.2 (8)	8.6 (6)	5.0 (7)
South Carolina	21.9 (7)	54.9 (4)	18.4 (7)	26.2 (9)	66.6(13)	11.0(13)	5.7(12)	2.0(15)
Tennessee	21.4 (9)	60.9 (1)	21.5 (3)	*	71.8 (3)	8.6(15)	4.8(14)	3.3(13)
Utah	17.4(15)	42.7(13)	15.3(15)	16.1(12)	66.8(12)	10.5(14)	3.2(15)	3.9(12)
West Virginia	25.7 (1)	60.7 (2)	23.7 (1)	32.8 (2)	75.9 (1)	11.6(12)	5.7(12)	2.9(14)
Wisconsin	24.6 (3)	50.4 (8)	18.1 (8)	27.4 (7)	67.9(11)	28.9 (1)	10.3 (3)	11.3 (1)

*Data not available.
Source: Centers for Disease Control. Behavioral risk-factor surveillance - selected states, 1984. MMWR 1986; 35:253-4.

Appendix C

Behavioral Risk Factor Prevalences (%) in 21 States and the District of Columbia United States, 1985

State	Obesity	Sedentary Lifestyle	Current Hypertension	Current Smoking	Seatbelt Nonuse	Binge Drinking	Heavier Drinking	Drinking & Driving
	% (Rank)	% (Rank)	% (Rank)	% (Rank)	% (Rank)	% (Rank)	% (Rank)	% (Rank)
Arizona	20.2(17)	46.1(20)	16.9(16)	26.4(14)	54.1(18)	19.0 (9)	9.3 (3)	5.6 (6)
California	17.7(21)	53.5(13)	17.0(15)	25.6(17)	47.0(21)	17.3(11)	8.2 (7)	3.3(14)
Connecticut	18.0(20)	52.8(15)	15.9(17)	26.7(12)	58.2(14)	20.6 (6)	9.2 (5)	5.8 (5)
District of Columbia	19.3(19)	54.9(11)	18.4 (9)	26.0(16)	50.6(19)	15.2(15)	6.3(10)	2.6(19)
Florida	21.6(10)	51.5(17)	21.2 (1)	27.2(11)	57.3(16)	17.3(11)	9.3 (3)	3.4(13)
Georgia	21.0(13)	63.8 (5)	18.4 (9)	28.7 (6)	63.3(12)	15.3(14)	5.9(12)	3.9(10)
Idaho	20.7(14)	44.2(22)	15.7(18)	23.7(21)	65.8 (7)	15.6(13)	5.9(12)	3.3(14)
Illinois	22.5 (8)	52.4(16)	17.5(12)	26.2(15)	49.6(20)	21.2 (5)	10.9 (1)	6.3 (4)
Indiana	27.6 (1)	64.5 (3)	20.4 (3)	32.2 (1)	69.2 (4)	19.3 (8)	4.9(18)	3.8(11)
Kentucky	25.9 (4)	61.4 (7)	20.2 (4)	29.2 (4)	68.5 (5)	8.8(21)	5.2(15)	1.7(21)
Minnesota	20.4(15)	55.7(10)	15.4(19)	27.8 (8)	65.0(10)	23.3 (3)	6.6 (9)	6.8 (3)
Montana	20.3(16)	45.0(21)	15.1(20)	24.6(19)	67.5 (6)	22.4 (4)	5.9(12)	5.5 (7)
New York	21.3(11)	51.5(17)	20.2 (4)	31.4 (2)	17.6(22)	19.0 (9)	8.9 (6)	4.2 (9)
North Carolina	19.5(18)	57.7 (9)	17.5(12)	27.4(10)	54.8(17)	12.6(18)	4.9(18)	3.7(12)
North Dakota	24.7 (6)	54.6(12)	14.7(21)	25.6(17)	77.2 (1)	24.0 (2)	3.7(21)	9.8 (1)
Ohio	25.9 (4)	61.3 (8)	17.3(14)	28.7 (6)	58.2(14)	19.8 (7)	7.5 (8)	4.5 (8)
Rhode Island	21.1(12)	65.1 (2)	19.2 (8)	29.4 (3)	69.9 (3)	12.9(17)	6.1(11)	3.0(17)
South Carolina	23.2 (7)	64.5 (3)	18.3(11)	29.2 (4)	65.6 (8)	9.8(20)	5.2(15)	3.3(14)
Tennessee	22.0 (9)	67.8 (1)	20.1 (6)	27.5 (9)	65.1 (9)	6.3(22)	5.0(17)	1.7(21)
Utah	17.7(21)	47.5(19)	14.5(22)	15.6(22)	61.4(13)	12.2(19)	3.0(22)	2.5(20)
West Virginia	27.4 (2)	61.7 (6)	21.2 (2)	26.7(12)	70.9 (2)	13.6(16)	4.6(20)	2.8(18)
Wisconsin	26.6 (3)	53.5(13)	19.9 (7)	24.6(19)	64.0(11)	27.3 (1)	9.4 (2)	9.3 (2)

Source: Centers for Disease Control. Behavioral risk-factor surveillance - selected states, 1985. MMWR 1986; 35:441-4.

Appendix D

BEHAVIORAL RISK FACTOR PREVALENCES (%) IN 25 STATES AND THE DISTRICT OF COLUMBIA
UNITED STATES, 1986

STATE	OBESITY	SEDENTARY LIFESTYLE	CURRENT HYPERTENSION	CURRENT SMOKING	SMOKELESS TOBACCO	SEATBELT NONUSE	BINGE DRINKING	HEAVIER DRINKING	DRINKING & DRIVING
	% (Rank)	% (Rank)	% (Rank)	% (Rank)	% (Rank)	% (Rank)	% (Rank)	% (Rank)	% (Rank)
Alabama	22.9(12)	60.9(10)	15.6(20)	24.6(20)	9.8 (2)	62.7 (3)	10.2(24)	5.4(18)	1.6(25)
Arizona	18.3(24)	49.9(23)	14.3(25)	24.4(22)	2.3(20)	44.1(16)	16.7(14)	8.3 (6)	4.0(13)
California	21.5(19)	58.0(16)	16.2(15)	24.5(21)	1.3(21)	20.2(23)	17.1(13)	7.8 (8)	4.8 (7)
District of Columbia	26.1 (4)	55.9(17)	18.2(10)	26.6(12)	1.2(22)	28.1(22)	16.2(15)	7.8 (8)	2.7(21)
Florida	21.0(21)	62.5 (8)	18.1(11)	27.9 (6)	2.7(18)	42.4(17)	17.7(10)	9.8 (4)	4.7 (8)
Georgia	20.5(22)	65.0 (5)	18.3 (9)	27.2 (8)	7.5 (4)	60.6 (7)	12.7(22)	4.3(23)	3.8(14)
Hawaii	16.5(26)	48.0(26)	16.0(18)	24.4(22)	1.1(23)	8.8(26)	21.1 (6)	9.9 (3)	3.6(15)
Idaho	22.9(12)	51.8(22)	15.3(24)	23.4(24)	3.2(14)	51.2(11)	17.6(12)	5.7(17)	3.6(15)
Illinois	22.0(18)	64.9 (6)	18.4 (8)	27.8 (7)	4.1(10)	35.4(18)	19.6 (8)	8.1 (7)	7.3 (2)
Indiana	25.2 (7)	59.4(14)	19.0 (5)	27.2 (8)	3.2(14)	59.1 (9)	17.7(10)	7.6(11)	4.5(10)
Kentucky	25.6 (6)	72.2 (1)	18.0(12)	34.7 (1)	5.8 (8)	63.8 (2)	11.2(23)	6.2(16)	1.5(26)
Massachusetts	22.2(17)	52.3(21)	18.5 (7)	27.0(10)	0.4(25)	33.3(20)	23.5 (4)	10.6 (2)	5.6 (5)
Minnesota	22.3(16)	54.6(19)	16.0(18)	25.1(19)	3.0(16)	48.3(13)	23.7 (3)	7.6(11)	5.6 (5)
Missouri	26.3 (3)	60.0(12)	21.2 (2)	25.7(18)	4.5 (9)	47.3(15)	18.9 (9)	6.7(15)	4.5(10)
Montana	21.2(20)	48.7(25)	15.4(23)	23.0(25)	8.8 (3)	61.8 (6)	22.6 (5)	4.6(22)	6.6 (3)
New Mexico	18.4(23)	53.5(20)	12.2(26)	26.1(15)	3.3(13)	19.9(24)	13.1(19)	7.8 (8)	4.4(12)
New York	22.5(15)	59.6(13)	16.1(17)	27.0(10)	0.4(25)	17.8(25)	15.9(16)	7.4(13)	2.0(24)
North Carolina	25.2 (7)	61.9 (9)	17.5(13)	26.5(13)	7.0 (5)	30.6(21)	12.9(21)	5.2(19)	3.5(17)
North Dakota	26.0 (5)	63.4 (7)	15.6(20)	26.0(16)	6.0 (7)	71.2 (1)	23.9 (2)	4.7(21)	5.8 (4)
Ohio	23.7(11)	58.1(15)	17.0(14)	28.0 (4)	3.4(12)	35.4(18)	20.2 (7)	9.4 (5)	4.7 (8)
Rhode Island	25.0 (9)	65.6 (3)	19.6 (3)	30.2 (2)	0.5(24)	59.4 (8)	14.7(17)	7.4(13)	2.8(20)
South Carolina	24.2(10)	66.5 (2)	18.9 (6)	26.5(13)	3.6(11)	52.4(10)	7.2(26)	4.0(25)	2.6(22)
Tennessee	22.7(14)	65.5 (4)	19.6 (3)	28.0 (4)	6.1 (6)	50.6(12)	9.9(25)	3.7(26)	2.0(23)
Utah	17.4(25)	49.1(24)	16.2(15)	18.2(26)	2.5(19)	47.4(14)	13.3(18)	4.3(23)	3.4(18)
West Virginia	27.7 (2)	60.9(10)	22.3 (1)	29.1 (3)	10.2 (1)	61.9 (4)	13.1(19)	5.2(19)	2.9(19)
Wisconsin	28.7 (1)	54.9(18)	15.5(22)	26.0(16)	2.9(17)	61.9 (4)	29.6 (1)	10.8 (1)	9.6 (1)

Source: Centers for Disease Control. Behavioral risk-factor surveillance - selected states, 1986. MMWR 1987; 36:252-4.

Appendix E

BEHAVIORAL RISK FACTOR PREVALENCES (%) IN 31 STATES AND THE DISTRICT OF COLUMBIA
UNITED STATES, 1987

STATE	OBESITY	SEDENTARY LIFESTYLE	CURRENT HYPERTENSION	CURRENT SMOKING	SMOKELESS TOBACCO	SEATBELT NONUSE	BINGE DRINKING	HEAVIER DRINKING	DRINKING & DRIVING
	% (Rank)	% (Rank)	% (Rank)	% (Rank)	% (Rank)	% (Rank)	% (Rank)	% (Rank)	% (Rank)
Alabama	25.2(15)	59.0(16)	24.9 (2)	27.1 (8)	6.2 (3)	55.8 (5)	12.5(23)	5.6(16)	2.6(19)
Arizona	20.3(28)	57.4(20)	20.8(24)	26.2(11)	3.0(18)	43.9(14)	17.6(12)	8.0 (6)	3.5(13)
California	21.4(26)	53.2(28)	20.7(25)	21.3(29)	0.9(26)	19.1(25)	17.8(11)	8.9 (3)	3.9(10)
District of Columbia	24.9(18)	63.5 (8)	21.2(22)	24.2(21)	0.8(27)	14.1(30)	9.0(29)	4.7(21)	1.8(28)
Florida	23.3(22)	59.0(16)	20.4(27)	28.0 (5)	2.6(23)	17.9(26)	15.3(15)	7.0 (8)	3.3(16)
Georgia	23.7(21)	64.2 (6)	24.4 (3)	25.0(17)	4.6(10)	53.0 (8)	10.6(27)	4.4(23)	2.2(23)
Hawaii	18.1(32)	51.0(29)	21.5(20)	22.5(27)	0.6(28)	7.0(32)	23.3 (2)	9.2 (2)	3.5(13)
Idaho	23.9(19)	55.1(26)	21.2(22)	20.5(31)	5.1 (8)	42.1(16)	15.3(15)	5.0(20)	2.3(22)
Illinois	26.3(10)	57.4(20)	22.2(16)	25.8(14)	1.9(25)	37.8(18)	14.1(17)	6.5(12)	3.9(10)
Indiana	28.8 (2)	59.8(15)	23.4 (9)	28.7 (4)	3.6(15)	42.2(15)	13.2(20)	3.8(31)	2.4(21)
Kentucky	26.4 (8)	69.6 (2)	24.3 (3)	32.3 (1)	4.6(10)	60.2 (3)	8.1(30)	4.2(27)	1.3(32)
Maine	26.9 (5)	58.8(18)	21.9(19)	27.7 (6)	2.7(21)	55.3 (6)	13.6(19)	7.4 (7)	1.7(29)
Maryland	23.3(22)	60.2(13)	23.4 (9)	24.8(18)	0.3(32)	21.8(23)	14.1(17)	8.4 (5)	2.8(17)
Massachusetts	22.9(25)	56.3(24)	23.7 (7)	26.3(10)	0.5(30)	45.4(13)	20.6 (7)	8.8 (4)	4.2 (8)
Minnesota	25.3(14)	56.6(23)	22.3(15)	24.3(19)	3.4(16)	36.4(20)	22.2 (5)	6.7(11)	5.2 (4)
Missouri	26.4 (8)	62.2 (9)	23.6 (8)	29.2 (2)	2.9(20)	37.7(19)	17.9(10)	6.1(14)	4.2 (8)
Montana	19.1(30)	47.2(32)	14.3(32)	22.3(28)	6.5 (2)	49.7(11)	22.6 (3)	4.5(22)	6.3 (3)
Nebraska	25.8(11)	59.9(14)	22.1(18)	24.0(22)	4.2(12)	49.6(12)	19.4 (9)	5.1(19)	6.6 (2)
New Mexico	18.6(31)	57.0(22)	15.1(31)	20.9(30)	3.0(18)	17.8(27)	6.6(32)	3.9 (3)	2.0(27)
New York	23.1(24)	73.5 (1)	17.2(30	23.2(25)	0.6(28)	21.7(24)	13.2(20)	5.2(18)	2.2(23)
North Carolina	23.8(20)	61.3(10)	20.6(26)	26.1(12)	5.8 (6)	13.9(31)	11.5(25)	4.4(23)	1.7(29)
North Dakota	26.7 (7)	61.3(10)	22.4(13)	23.7(23)	5.0 (9)	69.1 (2)	22.5 (4)	4.3(25)	5.6 (7)
Ohio	28.9 (1)	67.1 (4)	22.4(13)	26.8 (9)	3.1(17)	27.0(22)	17.0(14)	6.3(13)	3.6(12)
Rhode Island	20.4(27)	68.7 (3)	17.9(29)	24.3(19)	0.5(30)	52.6 (9)	7.7(31)	6.9 (9)	1.7(29)
South Carolina	25.2(15)	60.5(12)	23.9 (5)	25.3(15)	6.1 (4)	52.4(10)	11.9(24)	5.6(16)	3.5(13)
South Dakota	26.8 (6)	61.3(10)	21.4(21)	25.2(16)	4.6(10)	72.2 (1)	20.6 (7)	4.2(27)	5.7 (6)
Tennessee	25.6(12)	66.5 (5)	23.9 (5)	27.7 (6)	5.9 (5)	33.8(21)	10.2(28)	4.1(29)	2.6(19)
Texas	25.6(12)	56.0(25)	22.6(12)	23.0(26)	5.6 (7)	16.5(29)	21.9 (6)	6.9 (9)	6.1 (5)
Utah	19.7(28)	49.9(30)	18.2(28)	15.0(32)	2.4(24)	39.2(17)	11.0(26)	4.3(25)	2.1(26)
Washington	25.1(17)	47.4(31)	23.3(11)	23.7(23)	3.7(14)	17.0(28)	17.3(13)	6.1(14)	2.8(17)
West Virginia	27.6 (4)	64.2 (6)	25.2 (1)	28.8 (3)	8.2 (1)	59.2 (4)	13.1(22)	3.7(32)	2.2(23)
Wisconsin	28.5 (3)	54.0(27)	22.2(16)	26.0(13)	2.7(21)	54.0 (7)	29.4 (1)	9.7 (1)	8.2 (1)

Source: Centers for Disease Control. Behavioral risk-factor surveillance - selected states, 1987. MMWR 1989; 38:469-476..

Appendix F

BEHAVIORAL RISK FACTOR PREVALENCES (%) IN 36 STATES AND THE DISTRICT OF COLUMBIA
UNITED STATES, 1988

STATE	OBESITY	SEDENTARY LIFESTYLE	CURRENT HYPERTENSION	CURRENT SMOKING	SMOKELESS TOBACCO	SEATBELT NONUSE	BINGE DRINKING	HEAVIER DRINKING	DRINKING & DRIVING
	% (Rank)	% (Rank)	% (Rank)	% (Rank)	% (Rank)	% (Rank)	% (Rank)	% (Rank)	% (Rank)
Alabama	26.2(13)	57.8(19)	19.7 (3)	26.2(11)	6.8 (3)	47.8(10)	10.7(28)	4.2(32)	1.6(32)
Arizona	22.4(31)	53.0(28)	16.2(25)	23.5(26)	3.0(20)	35.8(13)	16.6(16)	6.4(15)	2.9(23)
California	25.1(20)	48.8(34)	15.2(32)	22.2(30)	1.3(28)	18.4(33)	15.8(18)	8.4 (6)	3.9(10)
Connecticut	23.3(26)	57.6(21)	15.8(27)	26.7 (7)	0.9(31)	25.2(23)	17.3(12)	9.0 (3)	3.8(12)
District of Columbia	26.3(12)	66.7 (4)	17.3(19)	20.1(35)	0.6(34)	20.8(30)	7.1(37)	5.8(19)	2.2(29)
Florida	25.8(16)	52.6(30)	19.5 (6)	23.9(23)	2.5(23)	21.5(29)	13.6(24)	8.5 (5)	2.5(28)
Georgia	22.3(32)	61.7(11)	14.5(35)	25.1(16)	3.0(19)	33.9(14)	16.5(17)	6.5(13)	3.1(20)
Hawaii	19.7(35)	53.3(27)	15.3(29)	23.7(25)	0.8(32)	6.5(37)	19.6 (6)	9.4 (2)	3.6(14)
Idaho	22.8(27)	51.0(32)	15.7(28)	20.1(34)	3.8(14)	37.5(12)	14.0(23)	4.3(31)	3.2(18)
Illinois	26.6(10)	57.8(20)	18.7(13)	26.8 (5)	1.7(26)	32.5(18)	18.0(10)	5.7(21)	2.9(24)
Indiana	29.2 (2)	60.2(13)	20.5 (2)	27.3 (4)	3.6(15)	30.1(19)	15.3(19)	5.1(27)	3.5(16)
Iowa	23.5(24)	58.3(18)	15.1(34)	22.3(29)	2.9(21)	23.7(26)	15.3(20)	5.2(24)	3.2(19)
Kentucky	26.7 (8)	67.1 (3)	18.9(11)	34.2 (1)	6.1 (4)	52.5 (4)	8.3(34)	3.6(35)	1.4(37)
Maine	26.4(11)	58.6(17)	15.8(26)	26.4 (9)	1.6(27)	49.2 (8)	14.7(22)	6.9(10)	2.9(25)
Maryland	22.0(34)	64.4 (8)	19.1(10)	25.1(17)	0.1(37)	18.9(32)	8.9(33)	3.8(34)	1.5(34)
Massachusetts	26.0(14)	52.9(29)	16.5(24)	26.4 (8)	0.2(36)	49.6 (7)	18.4 (8)	7.5 (7)	4.6 (7)
Michigan	28.3 (4)	*	18.5(15)	26.2(10)	3.4(16)	22.4(28)	23.3 (3)	7.4 (8)	4.9 (6)
Minnesota	25.2(18)	53.5(26)	16.9(21)	22.5(28)	3.3(17)	26.7(22)	22.6 (4)	6.7(11)	5.9 (5)
Missouri	26.7 (9)	59.0(16)	19.6 (4)	26.0(14)	2.6(22)	24.9(24)	15.2(21)	6.5(12)	2.7(26)
Montana	17.3(37)	46.7(35)	11.9(37)	19.9(36)	7.9 (2)	30.1(20)	24.8 (2)	6.4(14)	8.9 (1)
Nebraska	26.9 (7)	60.5(12)	18.3(17)	20.9(33)	4.4(10)	51.3 (6)	17.0(13)	6.0(17)	4.3 (8)
New Hampshire	23.3(25)	55.4(25)	19.2 (9)	28.0 (3)	0.9(30)	52.4 (5)	17.6(11)	10.8 (1)	3.5(15)
New Mexico	18.8(36)	51.8(31)	14.4(36)	24.0(21)	4.3(11)	20.2(31)	13.4(26)	5.7(22)	3.0(22)
New York	25.1(21)	73.6 (1)	16.7(22)	23.9(22)	0.6(33)	24.1(25)	13.5(25)	5.1(25)	1.8(31)
North Carolina	24.7(22)	63.7 (9)	16.7(23)	26.2(13)	5.4 (5)	13.1(36)	11.9(27)	5.1(26)	3.1(21)
North Dakota	28.2 (5)	57.5(22)	15.1(33)	22.1(31)	3.9(13)	60.5 (2)	21.7 (5)	3.3(37)	5.9 (4)
Ohio	25.9(15)	63.1(10)	17.4(18)	26.2(12)	3.2(18)	27.8(21)	17.0(14)	6.3(16)	3.6(13)
Oklahoma	22.5(28)	59.7(14)	18.8(12)	24.2(20)	5.1 (6)	33.6(15)	10.4(29)	5.4(23)	3.4(17)
Rhode Island	22.4(29)	64.8 (7)	15.3(31)	24.3(19)	0.5(35)	47.0(11)	8.2(35)	5.8(20)	2.6(27)
South Carolina	25.8(17)	65.4 (6)	18.6(14)	25.6(15)	4.7 (8)	48.7 (9)	9.8(30)	4.3(29)	1.4(35)
South Dakota	27.6 (6)	56.8(23)	16.9(20)	21.1(32)	4.9 (7)	67.4 (1)	19.3 (7)	4.1(33)	6.0 (3)
Tennessee	25.1(19)	67.3 (2)	19.5 (5)	29.8 (2)	4.5 (9)	32.5(17)	9.0(32)	4.7(28)	2.2(30)
Texas	22.3(33)	59.7(15)	15.3(30)	23.7(24)	4.1(12)	15.4(35)	16.9(15)	7.0 (9)	3.9(11)
Utah	22.4(30)	50.3(33)	19.4 (7)	14.7(37)	1.0(29)	33.3(16)	7.3(36)	3.4(36)	1.5(33)
Washington	23.9(23)	45.3(36)	18.3(16)	24.6(18)	2.2(25)	16.0(34)	18.3 (9)	5.9(18)	4.0 (9)
West Virginia	29.0 (3)	66.0 (5)	19.2 (8)	26.7 (6)	9.7 (1)	56.1 (3)	9.1(31)	4.3(30)	1.4(36)
Wisconsin	34.3 (1)	55.4(24)	22.2 (1)	23.1(27)	2.3(24)	23.4(27)	25.3 (1)	8.6 (4)	6.2 (2)

*Data not available.
Source: Centers for Disease Control. Behavioral risk-factor surveillance - selected states, 1988. Unpublished data.